June 15, 2018

VIA ELECTRONIC FILING

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: Ex Parte Presentation, *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258

Dear Ms. Dortch,

A wide diversity of stakeholders has urged the Federal Communications Commission ("Commission") to finalize the rules for the 3.5 GHz band Citizens Broadband Radio Service ("CBRS") and promptly auction Priority Access Licenses ("PALs") to ensure that critical mid-band spectrum is made available for wireless broadband use.[1] Nations around the world are accelerating 5G deployment using mid-band spectrum.[2] A recent report shows that China holds a narrow lead in overall 5G readiness, just ahead of South Korea and the United States,

[1] *See, e.g.*, Letter from Rebecca Murphy Thompson, Competitive Carriers Association, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258, at 4 (filed Mar. 15, 2018); Letter from K. C. Halm, Shentel, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258, at 1 (filed Mar. 21, 2018) (urging the FCC to adopt a framework that will permit "expeditious deployment"); Letter from Brian Hendricks, Nokia, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed Mar. 15, 2018).

[2] Letter from Meredith Attwell Baker, CTIA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258, at 4 (filed May 30, 2018) ("CTIA May 30 Letter").

due in large part to the availability of mid-band spectrum.[3] Indeed, in terms of mid-band spectrum availability, the United States will drop to sixth out of ten countries by the end of 2018.[4] China's operators already have access to 3.5 GHz spectrum and are actively engaged in 5G testing. South Korea and Japan have committed to release spectrum in the 3.6-4.2 GHz range by this month and next year, respectively.[5]

Given the potential importance of the 3.5 GHz band to America's 5G spectrum portfolio, the Commission should act expeditiously to adopt a 3.5 GHz Order that ensures the framework for PALs in the 3.5 GHz band incentivizes investment by a broad array of potential bidders and in an efficient manner. To achieve these goals, CTIA urges the Commission to adopt a license framework consistent with the compromise proposal filed by the Competitive Carriers Association ("CCA") and CTIA,[6] and endorsed by large and small providers that are seeking access to much-needed mid-band spectrum to invest and compete internationally. The CTIA/CCA proposal will make spectrum available in a way that will allow winning bidders to put the 3.5 GHz band to the most productive and efficient use as expeditiously as possible, enabling the U.S. to accelerate 5G and other innovative wireless deployments.

Recent filings in this proceeding reflect efforts by multiple stakeholders to craft a compromise geographic area solution for PALs. Indeed, CTIA originally proposed that the Commission license the 3.5 GHz band on the basis of Partial Economic Areas ("PEAs"), which have been repeatedly endorsed by the Commission as a compromise solution that enables

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[3] David Abecassis, Chris Nickerson, and Janette Stewart, *Global Race to 5G – Spectrum and Infrastructure Plans and Priorities*, ANALYSYS MASON, at 37 (Apr. 2018), https://api.ctia.org/wp-content/uploads/2018/04/Analysys-Mason-Global-Race-To-5G_2018.pdf ("Analysys Mason Report").

[4] *Id*. at 35.

[5] CTIA May 30 Letter at 4.

[6] *See* Letter from Rebecca Murphy Thompson, Competitive Carriers Association, and Scott K. Bergmann, CTIA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed Apr. 20, 2018).

both large and small entities to obtain access to spectrum.[7] The Commission has turned to PEAs to provide access to spectrum ranging from low-band (including the 2014 600 MHz auction) to high-band (including the recently adopted rules for the 24 GHz, 37 GHz, 39 GHz, and 47.2-48.2 GHz bands).

In the spirit of compromise and to provide opportunities for access to spectrum on even smaller license areas, CTIA and CCA recently jointly proposed that the Commission award PALs using Metropolitan Statistical Areas ("MSAs") in the top 306 Cellular Market Areas ("CMAs") and 2,437 county-sized license areas in the remaining 428 CMAs.[8] This approach will promote investment, innovation, and intensive use by a broad array of stakeholders. The CTIA/CCA proposal will enable an auction next year and achieve prompt access to the CBRS band without creating the needless complexity that would result from census tract licensing. As Senators Daines, Barrasso, and Sullivan recently wrote, the Commission has frequently licensed spectrum using CMAs with "great success," and a hybrid model incorporating county-equivalents "could allow for the best penetration and expansion into our rural areas."[9]

Other filings, however, continue to call for the use of census tract PALs for all or some of the PALs.[10] Census tracts have significant drawbacks – they would:

- Be administratively burdensome,
- Generate interference concerns,

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[7] CTIA Petition for Rulemaking, GN Docket No. 12-354 (filed June 16, 2017).

[8] *Id*.

[9] Letter from Sens. Steve Daines, John Barrasso, M.D., and Dan Sullivan, to Chairman Ajit Pai and Commissioners Mignon Clyburn, Michael O'Rielly, Brendan Carr, and Jessica Rosenworcel (dated Apr. 16, 2018) ("*Senators Daines, Barrasso, and Sullivan Letter*").

[10] *See, e.g.*, Letter from CBRS Coalition to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed May 29, 2018); Letter from James Crandall, American Petroleum Institute, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed May 11, 2018); Letter from John E. Benedict, CenturyLink, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed May 16, 2018).

- Increase the cost of deployment,
- Harm rural investment,
- Create economic inefficiencies,
- Impede and delay access to spectrum, and
- Significantly reduce the value of the CBRS band.

And importantly, an auction that includes census tract licensing – be it for all 70 megahertz of licensed spectrum in the 3.5 GHz band or only a portion – will necessarily result in delayed deployment. All of these factors suggest that the use of census tract licensing would significantly harm the ability of U.S. providers to harness the value of this limited licensed mid-band spectrum. As South Korea, Japan, and China license 3.5 GHz spectrum on a nationwide basis, the threat of census tract licensing here risks U.S. leadership in the next generation of wireless networks and services. CTIA therefore urges that any geographic area license compromise not include census tracts as part of that equation.

The Use of Census Tracts Would Be Unprecedented and Create Significant Administrative Complexity. Designing and holding an auction with licenses in more than 74,000 census tract areas would be an unprecedented and administratively complicated undertaking – and would ultimately delay access to this critical spectrum.

No U.S. spectrum auction has ever been based on license sizes as disaggregated and administratively challenging as census tracts. This is for good reason. A bidder seeking to provide coverage across New York City, for example, would have to win licenses in no fewer than 2,168 separate census tracts. In Washington, DC, a bidder would have to win licenses in 179 separate census tracts to cover the city. To provide coverage in Manhattan, Kansas, a bidder would have to win 13 census tracts.

As CTIA previously detailed, under the current rules, licensing by census tracts would require the Commission to auction more than 500,000 PALs, resulting in a complex and burdensome process to administer and for bidders to navigate. Even proposals to use census tracts for only two of the seven PALs would require the Commission and bidders to contend

with roughly 150,000 licenses. As Verizon has explained, "licensing by census tract at best adds tremendous administrative overhead to the process of acquiring PALs and building networks to align with areas where licensees actually want to operate, and at worst, arbitrarily limits the ability of licensees to deploy [Citizens Broadband Service Devices ("CBSDs")]."[11] The CTIA/CCA compromise proposal will reduce the more than 74,000 license areas and more than 500,000 licenses to roughly 2,700 license areas and 19,000 total licenses. Although this proposal will still require the Commission to auction smaller geographic areas (counties) and more licenses than it ever has in the past, it will dramatically reduce auction complexity for the Commission and bidders alike.

The Use of Census Tracts Would Create Significant Interference Concerns. Census tract licensing would also create a daunting number of interference borders that complicate the ability of PAL licensees to effectively manage interference issues among networks. The record demonstrates that the "cluttered and chaotic environment" that would result from any census tract licensing "would significantly limit the utility of the [3.5 GHz] band and result in less efficient and intensive use."[12]

Despite claims by the Wireless Internet Service Providers Association ("WISPA") and Google that the Spectrum Access Systems ("SASs") will adequately address any technical concerns,[13] applying SAS technology on a census tract basis dramatically increases the complexity of border management for all involved. For example, the SAS coordinators "are not even working on a channel assignment algorithm that would be capable of assigning the

[11] Reply Comments of Verizon at 7.

[12] Comments of Verizon at 10.

[13] Letter from Austin C. Schlick, Google, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed May 4, 2018); Letter from Stephen E. Coran, Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed May 2, 2018).

same channel to every contiguous PAL in a region."[14] And, such an algorithm would be "extremely difficult to create."[15] From a network design perspective, T-Mobile explains that as geographic area license sizes get smaller there is a greater likelihood a licensee will need to protect a nearby PAL Protection Area ("PPA") to the detriment of its own network.[16] AT&T notes that operators "will need to assume that adjacent markets are robustly utilized by PAL (or [General Authorized Access ("GAA")]) licensees," and "such protection means retracting the potential scope of deployment well inside the market area boundaries — a result that makes small Census Tract licenses extremely onerous."[17] The spectrum management role facing the SASs is novel and complex, and it is made significantly more challenging by using census tracts, which could undermine the overall likelihood of success of this licensing model.

Further, T-Mobile points out that carriers will likely deploy Time Division Duplex-Long Term Evolution ("TDD-LTE") in this band, and with the large number of census tract borders the "synchronization of uplink and downlink operations with adjacent licensees would be almost impossible to implement."[18] The ability to implement TDD networks would increase the efficiency of the band as TDD networks "prevent cross-cell interference and eliminate the need to use guard bands between adjacent frequency TDD networks."[19] In order to achieve synchronized operation, all base stations that may interfere with each other must: (1) have a common reference phase clock, and (2) use compatible frame structures (*e.g.*, length of frame,

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[14] Letter from Stacey Black, AT&T, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258, at 1 (filed Apr. 26, 2018) ("AT&T April 26 Letter").

[15] *Id*.

[16] Letter from Steve B. Sharkey, T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 at 2 (filed Apr. 25, 2018) ("T-Mobile April 25 Letter").

[17] *Id*. at 4.

[18] *Id*. at 3.

[19] *Coexistence of two time division duplex networks in the 2 300-2 400 MHz band*, Report ITU-R M.2374-0 (July 2015), https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2374-2015-MSW-E.docx.

TDD ratio, etc.) in order to align uplink/downlink periods.[20] Getting numerous operators to agree to parameters for synchronizing TDD operations will be challenging and impractical under a census tract licensing framework, as the vast number of borders decreases the likelihood of reaching agreement on synchronization parameters that are acceptable to all of the involved parties. This means that operators must either agree to sub-optimal network parameters or operate using a less spectrally efficient method. A single adjacent census tract licensee operating in a non-cooperative manner can disrupt synchronization efforts in a way that would ripple through the numerous census tracts in dense deployment areas.

Reducing the number of miles of border areas will limit the interference risks that PAL holders will need to plan for and manage and is yet another reason why the Commission should not pursue census tract licensing.[21] As T-Mobile notes, the micro-targeted business plan of some possible licensees "cannot supersede sound spectrum management and engineering practices."[22] The Commission should adopt rules that set the CBRS band up for success, including by adopting license sizes that will promote more technically efficient deployment in the 3.5 GHz band. The CTIA/CCA compromise proposal will do just that.

The Use of Census Tracts Would Result in Less Efficient, More Expensive Deployments. Stakeholders have demonstrated that census tract licensing would materially inhibit 5G deployment, preclude some full-power operations, and significantly raise the cost of deployment.[23] The number of interference borders created by census tracts would reduce the

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[20] Electronic Communications Committee, CEPT, Report 216 at 2 (Aug. 2014), https://www.ecodocdb.dk/download/220ac21f-b44b/ECCREP216.PDF. The current order of magnitude of accuracy required is about 1 to 3 µseconds of clock drift between base stations. *Id*.

[21] *See, e.g.*, T-Mobile April 25 Letter at 5.

[22] *Id*. at 6.

[23] T-Mobile April 25 Letter; Letter from Stacey Black, AT&T, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed Apr. 5, 2018) ("AT&T April 5 Letter"); Comments of Verizon at 10; Reply

overall utility and valuation of the band for mobile operators seeking to provide consumer broadband services.

As discussed above, when geographic areas are as small as census tracts, licensees may have to severely limit power and deploy many more CBSDs than would otherwise be required to protect nearby PPAs.[24] AT&T and others explain that this protection would come at a significant expense: substantially increased equipment and maintenance costs, additional backhaul requirements, and more siting approvals for CBSD deployment.[25] Contrary to WISPA's assertions, extension agreements would be impracticable under census tract licensing and are not a solution to the inefficient and expensive network deployments that would result from the use of census tracts. As T-Mobile notes, "[t]he sheer number of census tract-based licenses in an urban area like New York will make it infeasible to enter into those agreements."[26]

The cost of designing and deploying networks will increase significantly in a census tract licensing regime. Census tracts have no relationship to how networks are deployed and would arbitrarily limit the ability of licensees to deploy CBSDs in an efficient manner.[27] By largely eliminating the border interference issues posed by census tract licensing, the CTIA/CCA proposal will lead to more spectrally and economically efficient use of this sought-after spectrum.

Comments of GeoLinks at 3; Reply Comments of Mobile Future at 7-8; Comments of United States Cellular Corporation at 3-4.

[24] *Id.*; *see also* AT&T April 26 Letter at 1.

[25] *See, e.g.*, AT&T April 26 Letter at 1.

[26] Letter from Stephen E. Coran, Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed April 23, 2018); T-Mobile April 25 Letter at 3.

[27] Reply Comments of Verizon at 7.

The Use of Census Tracts Would Harm Rural Deployments. Census tracts do not promote the development of a diverse ecosystem of PAL holders across rural environments. A group of rural carriers (the "Rural Carriers") recently opposed a hybrid proposal of five county-sized PALs and two census tract-sized PALs because the framework "would reduce the opportunities for rural, operational carriers to access PALs."[28] The Rural Carriers understand the risks associated with trying to cobble together census tracts at an auction, and the very real possibility, even in rural areas, that a bidder could fail to win a crucial census tract, leading to more expensive deployment or stranded investments.[29] In one example from the record, a WISP that focuses almost exclusively on rural markets said that there are 82 census tracts that make up the "primary rural" census tracts (sparser than 1,000 people per square mile) where it currently provides coverage.[30]

Further, the notion that rural providers would be priced out of the auction if licenses were larger than census tracts is unfounded. Rural bidders frequently win licenses at auction – licenses that are significantly larger than census tracts. As CTIA previously noted, in the 600 MHz auction with PEA-sized licenses, qualified rural bidders won at least one license in more than 70 percent of the PEAs in which they bid.[31]

The CTIA/CCA proposal, with county-sized licenses covering 83 percent of the U.S. geography, will promote intense spectrum utilization and encourage deployment in both urban and rural areas by the widest group of stakeholders. Underscoring this point, the Rural

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[28] *See, e.g.*, Letter from Kirby J. Underberg, Missouri RSA No. 5 Partnership d/b/a/ Chariton Valley, F. Bradley Erwin, FTC Management Group, Inc., Michael F. Hagg, Horry Telephone Cooperative, Inc., Jim Lyon, Mark Twain Communications Company, David Byers, NEIT Wireless, LLC, Lee Chambers, Sandhill Telephone Cooperative, Inc., to Marlene H. Dortch, Secretary, FCC, at 1, 2 (filed May 29, 2018) ("Rural Carriers Letter").

[29] *Id*.

[30] Comments of Cal.net at 3.

[31] Reply Comments of CTIA at 17.

Carriers recently stated they "support the use of county-size licenses for PALs in rural areas" and "strongly prefer *all* 7 PALs in rural areas be licensed on a county-wide basis."[32] The Rural Carriers noted that the CTIA/CCA proposal "strikes the right balance" between rural needs and the need for "larger sized PALs in urban areas."[33]

The Use of Census Tracts is Not Necessary or Helpful to Support Targeted Buildouts. The CBRS rules create a novel approach to spectrum access that seeks to promote efficient spectrum use and enable targeted deployments. In fact, the Commission has provided access to 80 megahertz of the 3.5 GHz band on a GAA basis. Thus, the Commission is making more than half of the 150 megahertz of spectrum available on a licensed-by-rule basis, providing a "low-cost entry point" that will "promote competition, encourage flexible network deployments, and facilitate the efficient use of available spectrum."[34]

Moreover, a new range of tools promotes access by a wide range of entities to the limited amount of PAL spectrum, including those seeking to engage in only targeted buildouts. Management through the SAS, coupled with rules that allow PAL holders to partition or disaggregate spectrum into smaller parcels, and the PAL-GAA "use-or-share" framework, provide PAL licensees with strong incentives to make spectrum available on the secondary market to those who seek to acquire it for targeted deployments (*i.e.*, self-provisioning networks in factories or on campuses, or small rural broadband buildouts).[35]

When spectrum needs are so geographically precise and small, those needs may be better accommodated through a robust secondary market than an auction made unnecessarily

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[32] *See, e.g.*, Rural Carriers Letter at 1-2.

[33] *Id*.

[34] *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 4009 ¶ 155 (2015).

[35] *See, e.g.*, Comments of CTIA at 9; Comments of U.S. Cellular at 5; Comments of T-Mobile at 10-11.

complicated by requiring the Commission and bidders to manage 74,000 market areas and 150,000 or more licenses.[36] As Nokia has demonstrated, SAS technology creates a "frictionless subleasing market, empowering prospective users to request from licensees CBRS spectrum in highly-customizable geographic areas to meet their needs."[37] Thus, in addition to the 80 megahertz of spectrum that will be available on a GAA basis, the CTIA/CCA compromise will promote investment in the band and provide an opportunity for parties to acquire PAL spectrum in areas that best fit their business models and investment plans. And it is a far better solution than the existing census tract licensing framework.

The Use of Census Tracts Would Create Significant Exposure and Auction Efficacy Issues. An additional significant concern is the very real exposure risk that census tract licensing would create. As former FCC Chief Economist Professor Michelle Connolly explained earlier in the proceeding, "[f]or technologies/firms who need to guarantee full coverage of an area larger than census tracts, there is an exposure risk of not winning the entire set of PALs needed to cover their desired area and paying more than their valuation for the subset of licenses that they win."[38] And, notably, this exposure problem can occur whether a company must win all 2,168 census tracts in New York City or the number of census tracts covering a desired rural market. The Rural Carriers explained, for example, that there are 72 census tracts in Horry County, South Carolina where the Horry Telephone Cooperative provides service.[39] Even in Horry County, a bidder looking to serve the county under a census tract licensing regime

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[36] As the City of New York observed, "a secondary market will help ensure that smaller entities with a plan to serve a small area – say, a particular community, a stadium, or a shopping district – will be able to invest locally." Comments of the City of New York at 4.

[37] Letter from Jeffrey A. Marks, Nokia, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258 (filed Mar. 26, 2018).

[38] Comments of Michelle Connolly, Ph.D., *Impact of Proposed Changes to Improve Investment in the 3550-3700 MHz Band*, at 5 (Jan. 29, 2018), *attached to* CTIA Reply Comments ("Comments of Professor Connolly").

[39] *See, e.g.*, Rural Carriers Letter at 1.

would face uncertainty over its ability to acquire countywide coverage. Licensees large and small could be outbid in one or more census tracts critical to their deployment. And, exposure risks exist at the time of auction and in the secondary market as well. As Professor Daniel J. Vincent notes, "there is the incentive for sellers to hold out to be the last traders in the secondary market to capture the larger incremental gains."[40]

Moreover, as Professor Connolly explained, to achieve economies of scale, particularly for 5G, the most efficient license allocation size would be closer to the size of a PEA.[41] While CTIA has supported a broader mix of geographic area sizes in an effort to reach a compromise, it remains true that it is economically more efficient to disaggregate down to smaller licenses than aggregate up from "too small" licenses. As Professor Connolly observed, "the sheer number of secondary market transactions that would be needed to aggregate up from census tracts for several key technologies that require protected service over a larger area dwarfs the number of secondary transactions that would be needed to partition out from PEAs[.]"[42]

An operator's entire business plan would be at risk if it had to acquire PALs across a metropolitan, regional, or rural area by census tract and it was outbid in even one census tract. If such a provider were unable to sufficiently mitigate the loss of that census tract by either (1) acquiring it on the secondary market – possibly for a hefty price from a holdout winner, or (2) reconfiguring its network design – an expensive undertaking, the investment made in its other PALs could become stranded. As the Rural Carriers note "constructing a network utilizing census tracts would be inefficient and wasteful."[43] These economic realities provide yet another reason for the Commission to forgo census tract licensing.

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[40] Comments of Daniel R. Vincent at 5.

[41] Comments of Professor Connolly at 11.

[42] *Id.*; *see also* Comments of Daniel R. Vincent at 5.

[43] Rural Carriers Letter at 2.

The Commission should adopt the CTIA/CCA proposal to promote urban and rural deployments and reduce the exposure risks associated with failing to win critical markets. As Senators Daines, Barrasso, and Sullivan observed, the CBRS framework is best served by "a balanced approach using medium sized licenses areas," [44] such as MSAs and county-sized licenses.

The Use of Census Tracts Would Depress the Value of PAL Spectrum at Auction. The administrative burdens, exposure risks, and interference issues described above create genuine concerns for prospective bidders that will depress PAL auction values. Former Commissioner Harold Furchtgott-Roth found that small geographic areas are one factor likely to diminish the market value of PALs by 50 to 95 percent relative to the value of similar spectrum.[45] The CTIA/CCA approach will address many of the issues related to census tract licensing and create more value for CBRS spectrum.

The Use of Census Tracts Would Impede U.S. Wireless Leadership by Delaying Access to Licensed 3.5 GHz Spectrum. Notably, it is unclear whether the Commission's auction software is capable of handling 74,000 geographic areas and how long it would take to modify or create new software capable of accommodating such a vast number of markets – and hundreds of thousands of licenses. While some SAS administrator applicants contend that they can accommodate census tract licensing,[46] they can provide no insight into Commission's auction capabilities with respect to 74,000 license areas. But the Connect America Phase II Auction ("CAF-II") can.

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[44] *Senators Daines, Barrasso, and Sullivan Letter* at 2.

[45] *See* Harold Furchtgott-Roth, *The Potential Market Value and Consumer Surplus Value of The Citizens Broadband Radio Service (CBRS) at 3550-3700 in the United States*, at B-1-2 (Nov. 2017), https://www.cbrsalliance.org/whitepapers.

[46] Letter from CBRS Coalition to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258, at 5 (filed May 9, 2018); Letter from Jesse Caulfield, Key Bridge Wireless, and Heikki Kokkinen, FairSpectrum, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-258, at 1 (filed May 11, 2018).

The CAF-II auction will have 30,300 eligible geographic areas for which bidders may compete; a PAL auction with nationwide census tract licenses would more than double that number. The Commission rejected an even smaller geographic area size in the CAF-II context, because it would "significantly increase the complexity of the bidding process both for bidders and the bidding system."[47] That same reasoning applies with as much or more force in this proceeding and the possibility of using 74,000 census tracts to license PALs. Even if only two PALs in each area were licensed by census tract, the Commission's auction software would need to accommodate roughly *ten times* more licenses than offered in any other Commission auction to date.[48] The bidding complexity for both the Commission and bidders would be unprecedented. The fact the CAF-II auction procedures do not provide a computerized bidding interface but instead require use of bid upload files suggests that Commission auction software would be unable to support census tract licensing with 74,000 geographic areas, 150,000 or more licenses, and far more complexity than the CAF-II auction. In short, the CAF-II auction procedures provide affirmative evidence that the auction software is not ready for census tract licensing. The systems work necessary to accommodate a census tract auction will further delay the availability of licensed 3.5 GHz spectrum.

In deciding the appropriate geographic license areas for CBRS, the Commission should consider the impact on both timing and auction complexity. The need to auction the 3.5 GHz band next year is real and urgent. The United States should gain a foothold in mid-band spectrum for 5G as quickly as possible, and the 3.5 GHz band is the nearest term available

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[47] *Connect America Fund Phase II Auction Scheduled For July 24, 2018, Notice And Filing Requirements And Other Procedures For Auction 903*, Public Notice, 33 FCC Rcd 1428 ¶ 18 (2018).

[48] Since 1994, the average number of licenses auctioned per auction is 1,037. The largest number of licenses ever auctioned was in Auction 40, a paging auction, in which the Commission auctioned 15,514 licenses. *See* Auctions Summary, FCC, https://www.fcc.gov/wireless/auctions/auctions-summary.

spectrum.[49] CTIA does not share the CBRS Coalition's view that delay in the name of a new, complicated, and questionable geographic area license scheme is worthwhile.[50] The CTIA/CCA compromise avoids many of the complications a census tract framework creates and would permit the Commission to move forward promptly with an auction next year.

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CTIA supports meaningful compromise to the 3.5 GHz geographic area licensing debate and a solution that will allow a prompt auction that puts PALs in the marketplace. Census tracts, however, should not be part of any solution. Mid-band spectrum availability is a crucial piece of the 5G race, and CTIA continues to urge the Commission to move forward with an Order that begins the process of expeditiously putting this spectrum into use.

Pursuant to Section 1.1206 of the Commission's rules, a copy of this letter is being filed in ECFS. Please do not hesitate to contact the undersigned with any questions.

Sincerely,

/s/ Scott K. Bergmann
Scott K. Bergmann
Senior Vice President, Regulatory Affairs

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[49] *See How America's 4G Leadership Propelled the U.S. Economy*, RECON ANALYTICS, at 1 (Apr. 16, 2018); *id*. at 12-16 (describing the costs of losing generational leadership); Analysys Mason Report.

[50] CBRS Coalition May 9 Letter at 4 ("The Commission should take the time necessary to complete that developmental process.").